REMARKS

This is in response to the Office Action of April 1, 2009. Claim 1 as amended incorporates the features of claims 7 and 16. Claims 7, 8, 10-13, 15, and 16 are cancelled, without prejudice. No new matter is introduced by this Amendment. Claims 1, 2, 5, 9, and 14 are pending in the application.

The rejection under 35 U.S.C. § 112

Claims 1 and 10 were rejected under the second paragraph of 35 U.S.C. § 112 as failing to define the invention properly. Office Action, page 2. The rejection is respectfully traversed. The cancellation of claim 10 renders the rejection moot as to claim 10. With regard to the language "fiber extended yarn" in claim 1 to which the Examiner objects, Applicants respectfully offer the following explanation. The fiber-opening process refers to a process in which a bundle of fibers, which is an aggregate of a plurality of filaments, are separated in the fiber width direction. The fiber-opening process is applied to the bundle of fibers so that the width of the bundle of fibers is expanded. Those yarns obtained through the fiber-opening process are referred to as "fiber extended yarns." In the present invention, with respect to the multifilaments or laminated multifilaments recited in Applicants' claims, multifilament bundles having a width that is widened 2 to 5 times (preferably 2 to 4 times) more than the width of the original multifilament bundles (via the fiber-opening process) may be used. For example, a carbon-fiber multifilament bundle having a width of about 6 mm, formed by combining 12,000 carbon fibers (each having a diameter of 7 μm) with one another, is subjected to a fiber-opening process to form a flat multifilament (fiber extended yarn) bundle having a width of 20 mm. That is, the width of the fiber bundle is expanded from 6 mm to 20 mm – i.e., approximately 3 times the width of the original multifilament bundle. Withdrawal of the rejection of claim 1 under the second paragraph of 35 U.S.C. § 112 is accordingly requested.

The rejections over EP 0 144 939

Claims 1, 2, 5, 9-12, and 15 were rejected under 35 U.S.C. § 102(b) as being anticipated by EP 0 144 939 A2 (EP '939). Office Action, pages 2-3. Claims 14 and 16 were rejected under

35 U.S.C. § 103(a) as being unpatentable over 'EP '939. Office Action, pages 3-4. The rejections are respectfully traversed. The fabric of the present invention is significantly different from that of EP '939 in at least three major respects:

(1) weft yarns consist of multifilament yarns of polyolefin composite fibers in the present invention[1], while both weft yarns and warp yarns are formed of high strength multifilament such as carbon in EP '939.

(2) EP '939 does not use fiber extended yarns, while the present claims require "a fiber extended yarn made of multifilaments that form a flat shape having a degree of flatness in a range from 20 to 700 without twists."

(3) EP '939 neither teaches nor suggests a fabric structure in which a "reinforcing non-woven base fabric has a three-layer structure in which two upper layers and a lower layer of the groups of warp yarns with a fixed interval are placed, with the group of weft yarns being interpolated therebetween and the lower layer is laminated with an offset of a ½-pitch so as to place the yarn of the group of lower-layer yarns between the yarns of the groups of upper-layer yarns," as required by Applicants' claims[2].

Accordingly, withdrawal of the rejections of record over EP '939 is in order and is earnestly solicited.

The rejection over Kuroiwa, Nakamura, and Brunner

Claims 1, 2, 5, and 7-16 were rejected under 35 U.S.C. § 103(a) as being unpatentable over US 2001/0006866 A1 (Kuroiwa) in view of US 6,641,763 B2 (Nakamura) and US 5,452,507 (Brunner). Office Action, pages 4-7. The rejection is respectfully traversed.

The primary reference, Kuroiwa, neither teaches nor suggested the use of fiber extended yarns, which is – as discussed above – a significant feature of Applicants' invention.

Kuroiwa teaches in paragraph [0036] that "In accordance with the present invention, non-woven fabrics produced by the technology of multiaxially laminated non-woven fabrics, namely obliquely laminated triaxial, tetraaxial, pentaaxial and further multiaxial non-woven fabrics are

[1] Claim 1 recites "multifilament yarns as weft yarns, consisting of polyolefin composite fibers having a core-sheath structure in which the sheath portion is formed by a polymer having a lower melting point than that of the core portion."

[2] It is noted that this feature was formerly recited in claim 7, which was not rejected over EP '939.

used. These non-woven fabrics, unlike woven fabrics or cross laminated non-woven fabrics, are characterized by comprising obliquely crossing materials." (Emphasis added.) In paragraph [0037], Kuroiwa teaches that "The 'triaxial non-woven fabric' or 'triaxially laminated non-woven fabric' means a non-woven fabric resulting from lamination and bonding of constituent warp members (especially tows) and oblique members (especially tows) crossing the warp members in two directions, crossing each other with the warp members as approximate axes of symmetry. It may also be a non-woven fabric resulting from lamination and bonding of constituent weft members (especially tows) and oblique members (especially tows) crossing the weft members in two directions crossing each other with the weft members as approximate axes of symmetry."

The foregoing structures taught by Kuroiwa are significantly different from the fabric structures of the present invention. The reinforcing non-woven base fabric of the present invention has a three-layer structure in which two upper layers and a lower layer of the groups of warp yarns with a fixed interval are placed, with the group of weft yarns being interpolated therebetween and the lower layer being laminated with an offset of a ½-pitch so as to place the yarn of the group of lower-layer yarns between the yarns of the groups of upper-layer yarns.

Neither Nakamura nor Brunner remedies the foregoing deficiencies of the Kuroiwa reference. Accordingly, withdrawal of this prior art rejection is earnestly solicited.

Contact information

If there are any questions concerning the present application, the Examiner is respectfully requested to contact Richard Gallagher (Reg. No. 28,781) at (703) 205-8008.

Respectfully submitted,

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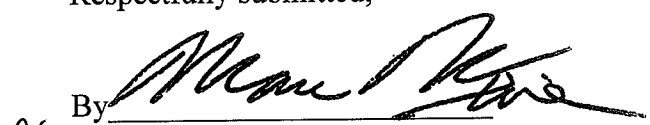
By 

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